

1 **ABSTRACT**

2 A scrambling architecture protects data streams in the operating system and
3 hardware components of a computer by scrambling the otherwise raw data prior to
4 the data being handled by the operating system. The architecture has a scrambler
5 implemented at either the client or the server that adds noise to the content. More
6 specifically, the scrambler produces periodic sets of tone patterns having varying
7 amplitudes based on a first key. The scrambler also generates a random signal
8 based on the first key and a second key. The tone patterns and random signal are
9 added to the content to scramble the content. The scrambled content is then
10 passed to the filter graph (or other processing system) where the content is
11 processed while scrambled. Any attacker attempting to siphon off the bits during
12 processing will steal only noisy data, which is worthless for redistribution or
13 copying purposes. After processing, the scrambled data is passed to a driver for
14 output. The driver implements a descrambler to unscramble the content by
15 subtracting out the random noise signal. The descrambler detects the tone patterns
16 in the content and recovers the first key from the varying amplitudes of the tone
17 patterns. The descrambler also receives the second key via a separate channel
18 (e.g., a cryptographically secured path) and generates the same random signal
19 using the recovered first key and the second key. The descrambler subtracts the
20 tone patterns and the random signal from the scrambled content to restore the
21 content.

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